

I will be able to discover and explain the sum of the measures of a triangle, develop inductive and deductive reasoning, and practice using geometry tools.

## 4.1 Triangle Sum Conjecture



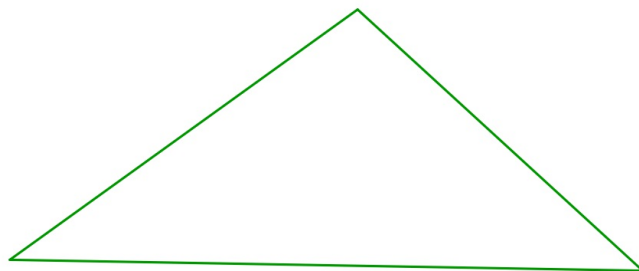
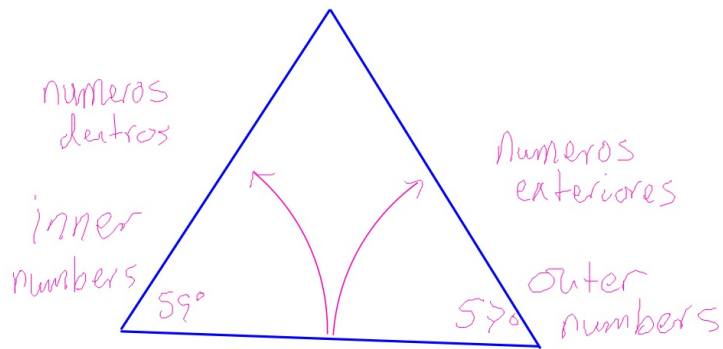
This is a partner activity. Each group needs:

All of the angles  
added to  $180^\circ$

1 protractor  
1 yellow half-sheet of paper  
1 writing instrument  
1 pair of scissors

- Draw three different triangles on one side of the paper.
- Each partner carefully measures the three angles of each triangle and finds the sum of the angles of each triangle. Write the measurements and the sum on a separate piece of paper.
- Compare your sums with your partner. If they are not the same, come up with some reasons why they might differ.
- Carefully cut out the triangles and label the three corners of each.
- Carefully tear one of the three triangles into three sections each so that one corner from the triangle is on each piece.
- Arrange the pieces of one triangle so that the vertices meet.
- Continue with the other two triangles.
- Propose a conjecture for your results.

In mathematics, a **conjecture** is a mathematical statement which appears to be true, but has not been formally proven. A **conjecture** can be thought of as the mathematicians way of saying "I believe that this is true, but I have no proof yet". A **conjecture** is a good guess or an idea about a pattern.



#### 4.1 Triangle Sum Conjecture

$$\angle 1 + \angle 2 + \angle 3 = 180^\circ$$

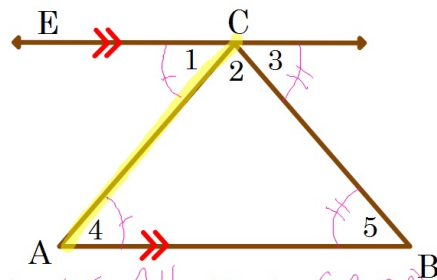
Prove  $\angle 2 + \angle 4 + \angle 5 = 180^\circ$

$\overleftrightarrow{EC} \parallel \overleftrightarrow{AB}$

$\angle 1 \cong \angle 4$  Ángulos Interiores Alternos (AIA)

$\angle 3 \cong \angle 5$  AIA

$$\angle 4 + \angle 2 + \angle 5 = 180^\circ$$



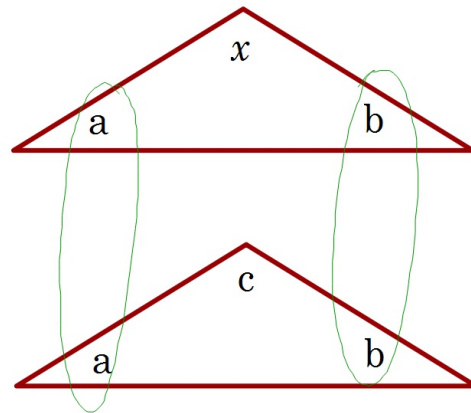
Los ángulos interiores de un triángulo suman a  $180^\circ$ .

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### Third Angle Conjecture

Si dos ángulos interiores de un triángulo son lo mismo entonces los tercer ángulos son congruentes también.



$$\begin{aligned} a + b + c &= 180^\circ \\ a + b + x &= 180^\circ \\ \therefore x &= c \end{aligned}$$

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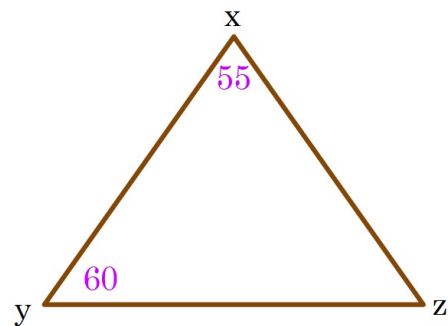
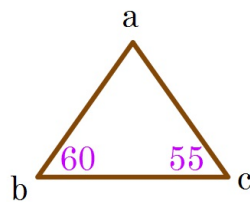
$$\angle C \cong \angle X$$

$$\angle b \cong \angle y$$

$$\angle a \cong \angle z$$

$$\begin{aligned} 60 + 55 + \underline{65} \\ = 180^\circ \end{aligned}$$

$$\angle a = \angle z = 65^\circ$$



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Exercises pp. 200-201 DG #1-22 Evens  
With a partner

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